MORGAN. (E.C.)

THE QUESTION

OF

HÆMORRHAGE FOLLOWING UVULOTOMY

REPORT OF TWENTY-THREE CASES OF OBSTINATE UVULAR HÆMORRHAGE; DESCRIPTION OF A UVULAR CLAMP; BIBLIOGRAPHY

BY

ETHELBERT CARROLL MORGAN, A.B., M.D.

WASHINGTON, D. C.

FIRST VICE-PRESIDENT OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION

READ BEFORE THE AMERICAN LARYNGOLOGICAL ASSOCIATION AT ITS EIGHTH ANNUAL CONGRESS, PHILADELPHIA.

Reprinted from the New York Medical Journal for October 16 and 23, 1886 and from the Transactions of the Association for 1886.

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HÆMORRHAGE FOLLOWING UVULOTOMY.

THE operation of uvulotomy, so often performed and attended with insignificant after-trouble, may in rare instances be the cause of anxiety by reason of persistent primary or secondary hæmorrhage. "Clipping the uvula" is with some practitioners an operation practiced upon patients suffering from almost any disease of the upper air-passages. We should never under-estimate the liability to annoying and even alarming complications in this simple operative procedure, and should be prepared to promptly check all bleeding. Most authors briefly dispose of the question of hæmorrhage following uvulotomy by saying that such hæmorrhage is usually unimportant, and can always be readily controlled by the use of styptics —notably the gallotannic acid of the London Throat Hospital Pharmacopœia. Following I give the opinions upon this subject of leading authors from 400 B. C. to 1886 A. D.:

Celsus* says: "If the uvula descends, accompanied with inflammation, pain, and redness, it can not be excised without danger; for it is likely to discharge a large quantity of blood."

Rhazes† states "that when the uvula is enlarged, but is not red, the operation may be performed without danger. He mentions that some preferred the actual or potential cautery, but that he preferred excision."

Guidon‡ mentions "that after excision of the uvula, if the bleeding should be excessive, dry cups must be applied to the back of the neck,

* Lib. vii, cap. xii, par. 3. Lee's Translation, London, vol. ii, 1836, p. 278.

† Contin., vii, and divis. i., 49. See "Paulus Ægeneta," Book VI, Lect. xxxi. Adams's Translation, London, vol. ii, 1846, p. 300.

‡ "Chirurgia magna," Leyden, 1585, p. 330.

as proposed by Avicenna, troches of amber with plantain-water administered, and the patient should be placed upon his face and told to expectorate in order to free his throat from blood, for, if any of the blood should descend, it might be the end of him."

Ravaton * says: "The wound bleeds, but the hæmorrhage is slight, and is stopped by gargling with fresh water."

Nich. B. Waters † says: "When the uvula is much enlarged, or there would be danger of considerable hæmorrhage from the use of the knife, the ligature should be preferred."

Benjamin Bell ‡ says: "By excision, troublesome hæmorrhages sometimes occur. Some practitioners indeed allege that no danger can ensue from any hæmorrhage that takes place from the removal of the uvula by excision; but, although this may frequently happen, yet I know from experience that instances of the contrary sometimes occur, and that large quantities of blood have been lost by this operation. This will most readily happen when the uvula is much enlarged. It will seldom happen, however, that any precaution [use of astringents] of this kind is necessary; for a moderate flow of blood will never do harm."

It is my opinion that the views of Benjamin Bell possess an accuracy worthy of the year 1886. His statements made in 1804 are in every way verified by my investigations to-day.

Desault # says: "It is seldom that a troublesome hæmorrhage results from the excision of the amygdalæ or uvula."

Liston ‖ says: "The connections [hypertrophy] may be such that the extirpation can not be attempted without great risk from hæmorrhage."

Gibson ^ quotes Benjamin Bell's remark about bleeding, and adds "that he had often operated, and never met with such an accident."

Troschel ◊ says: "The precautions against a severe bleeding are the same as in operations on the tonsil."

Dieffenbach ‡ says: "Bleeding is stopped with cold water. If more severe, powdered alum may be applied with a spoon; but I never found it necessary."

H. H. Smith ‡ says: "Whenever there be any hæmorrhage of consequence, touching the end of the stump with silver nitrate will generally arrest it."

* "Chirurgie," Paris, i, 1776, p. 264.
† "System of Surgery," Philadelphia," 1802, p. 317.
‡ "Surgery," Am. edition, Troy, N. Y., 1804, ii, p. 351.
# "Surgery," Philadelphia [Translation], 1814, i, p. 198.
‖ "Practical Surgery," London, 1838, p. 205.
^ "Surgery," Philadelphia, 1838, ii, p. 29.
◊ "Chirurgie," Berlin, 1839, i, p. 227.
‡ "Operative Surgery," Leipsic, 1848, ii, p. 94.
‡ "Operative Surgery," Philadelphia, 1852, p. 181.

Demounilliers* says: "The flow of blood resulting from the little operation usually stops of itself, or by the aid of an astringent gargle."

Gross† says "that no hæmorrhage, properly so called, need ever be looked for."

Gross‡ says "that no hæmorrhage need be looked for, nor is the excision attended with any great pain."

Gayraud# says: "Hæmorrhage is usually trifling; once Voss‖ saw it last all night. Where there is varicose development of the uvula, the bleeding may be considerable. Ancelor had to use in one case perchloride of iron, and in another the actual cautery. Voss preferred silver nitrate."

Mackenzie△ says: "Occasionally severe and continuous hæmorrhage follows the little operation, but it can always be checked by slowly sipping a teaspoonful or two of the tannogallic gargle."

Cohen◊ says: "The bleeding after excision of the uvula is usually insignificant; but occasionally it is quite profuse."

Browne‡ says: "If the patient be directed, after the operation, to sit perfectly still without washing the mouth, hæmorrhage but seldom occurs; should it happen, the sipping of a few drachms of a saturated solution of tannin will speedily check it."

Bosworth‡ says: "After the operation the hæmorrhage is slight, as a rule, and the wound heals kindly in the course of a few days or a week."

Sajous‡ says: "A ten-per-cent. solution of cocaine, applied just before the operation, renders it almost painless, and prevents the slight bleeding which usually occurs."

Seiler** says: "The pain and hæmorrhage in this operation are very slight; indeed, not infrequently altogether absent."

Schech†† says: "The wound heals in a few days without much pain."

He does not mention hæmorrhage in connection with uvulotomy.

Obstinate hæmorrhage following uvulotomy is a rare accident, and has never occurred in the Metropolitan Throat Hospital, New

* "Compendium de chirurgie," Paris, 1852–'61, iii.

† "Surgery," Philadelphia, 1859, p. 651.

‡ "Surgery," Philadelphia, 1872, ii, p. 553.

\# "Dict. Encycl. des sci. méd.," xix, p. 698.

‖ "Norsk. Mag. f. Lægevidensk," 3 R., vii, 1877, p. 77.

△ "Diseases of the Pharynx, Larynx, and Trachea," Philadelphia, vol. i, 1880, p. 41.

◊ "Diseases of the Throat," N. Y., 1879, p. 219.

‡ "The Throat and its Diseases," Philadelphia, 1878, p. 129.

‡ "Diseases of the Throat and Nose," N. Y., 1881, p. 96.

‡ "Diseases of the Nose and Throat," Philadelphia, 1885, p. 298.

** "Diseases of the Throat, Nose, etc.," Philadelphia, 1883, p. 185.

†† "Diseases of the Mouth, Throat, and Nose," Blaikie's transl., Edinburgh, 1886, p. 129.

York,* during ten years, and in over one thousand uvular operations. It has never happened in the Central London Throat and Ear Hospital, † and numerous other institutions in this country and Europe.

My experience up to this writing accorded with the views of the majority of the authors quoted above; but I certainly think the cases reported to-day would suggest the exercise of a little caution on the part of the enthusiastic uvulotomist. Moreover, a slight modification of existing opinions and generally accepted teachings may be demanded, as the result of the indisputable records furnished us by medical literature. Many operators are not content with excising the prolapsed portion of the uvula, but essay to remove all traces of the existence of this inoffensive little organ, thus unnecessarily increasing the danger of hæmorrhage, especially if great hypertrophy exists. The gentleman concerned in my report had been subjected to total excision, had been bleeding copiously at intervals during a period of five days prior to his application to me for relief, and was in a distressing state of body and mind.

Mr. V. A. H., aged twenty-eight, applied to me on March 24, 1885, stating that his uvula had been excised five days previously, and that, four hours after the operation and at short intervals since, he had experienced abundant hæmorrhage, for the control of which powdered iron persulphate, Monsel's solution, ice, alum, silver nitrate, gallo-tannic acid, and other styptics had been employed without success. He was greatly excited and anxious; his face pale, hands cold, and pulse weak Upon cleansing the parts and examining them by reflected light, two bleeding points, situated respectively near the anterior and posterior portion of the uvular stump, were visible, and occasioned a rapid and continuous dropping of blood upon the tongue. The stump left after the operation was with difficulty detected, as the mucous membrane and submucous tissues appeared to have retracted, leaving the azygos fasciculi uncovered. The uvula of Mr. H. had been greatly hypertrophied, as was fully proved by the broad, hard stump left after amputation. He informed me that the forceps and scissors were employed in operating. There was no hæmorrhagic diathesis in this patient, nor in any member of his family, and several of the latter had undergone surgical operations without experiencing any untoward consequences. I first removed the firm coagula of blood and iron persulphate which covered the hard and soft palate, pharyngeal walls, teeth, and tongue. The parts mentioned and the uvula were then cleansed by means of an alkaline spray and dried with absorbent cotton. The stump was firmly seized with a dressing forceps and continuous pressure exerted, but the hæmorrhage was only partially

* Personal communication from Dr. G. B. Hope.

† Personal communication from Mr. Lennox Browne, F. R. C. S.

controlled, as the patient could not tolerate the instrument for any length of time. The galvano-cautery blade, at a cherry-red heat, was freely applied to the bleeding surface, and the hæmorrhage was promptly controlled. An hæmostatic of ext. ergot fl. ʒ ss, acid. sulphuric. aromat. ♏ xx, tr. opii, ♏ xv, was ordered to be taken in water every three hours. He was directed to take his food in a liquid state and cold, and to refrain even from talking, using a writing tablet for necessary communication. The hæmorrhage recurred within nine hours, when the cautery was again successfully used and the stump dusted with powdered iron persulphate. He came to my office at 11 P. M. the same day saying he was bleeding, but examination proved only the presence of a firmly adherent coagulum, which I did not disturb. The following morning at eight o'clock, or the sixth day after the uvulotomy, a copious dripping of blood took place; strange as it may appear, by actual measurement, not less than a fluid-drachm flowing in a minute. The entire throat was again thoroughly cleansed and dried, and a careful rhinoscopic examination for the second time made to discover if the hæmorrhage could possibly proceed from the

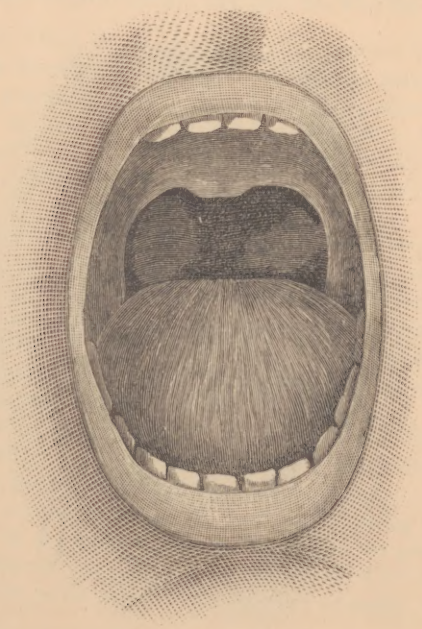

Fig. 1.

naso-pharynx, or from some pharyngeal vessel wounded during the performance of the original uvulotomy. The naso-pharynx and superior surface of the velum palati were free from blood and uninjured, showing

that the abundant hæmorrhage proceeded from the uvula alone, incredible as it appeared. Melted crystals of chromic acid were applied to the stump and the hæmorrhage was again checked. This state of affairs did not continue long, for at three o'clock of the same day persistent and copious bleeding recommenced. The stump was again subjected to the galvano-cautery, but the bleeding continued. An effort was made to transfix the base of the uvula by double suture (see Fig. 1), but there was insufficient stump to hold even a silk or silver thread. All ordinary methods having been exhausted without avail, and as I could not possibly ligate so short a uvula, I hoped to attain my purpose by torsion, or compressing the arteries and veins concerned. The first was tried to no purpose, but the second completely and permanently checked the hæmorrhage, although obtained in a novel manner. One of those small spring clamps used in retaining shirt-sleeves in position, and which can be purchased at any furnishing-store, was trimmed down with shears, the spring weakened, and a string attached to a perforation made in one of its arms. The arms of this improvised instrument were widely separated by means of a dressing forceps, quickly slipped over the uvula and well up on the soft palate; the forceps was withdrawn and the clamp remained securely fastened and in the de-

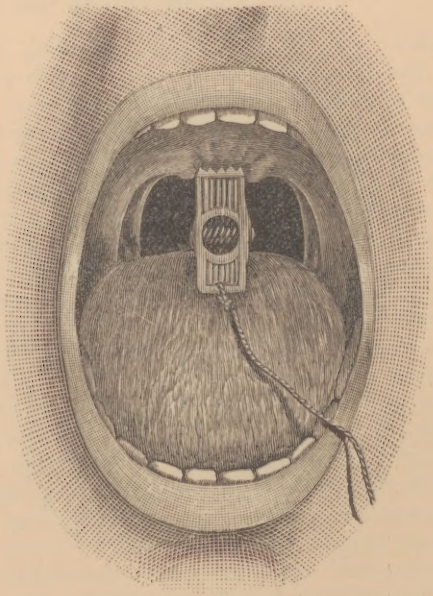

FIG. 2.

sired position. The teeth of the clamp had been slightly filed down prior to introduction, and the string attached to the instrument was secured

on the forehead of the patient. The upper portion of the clamp grasped and compressed the soft palate in the median line, and about one sixth of an inch above the point at which uvulotomy had been performed (see Fig. 2). The clamp was allowed to exercise pressure for several hours, when it was removed temporarily in order that the patient might take nourishment. It was, however, never necessary to replace this little device, which accomplished so thoroughly and rapidly the end for which it was employed.

After a laborious search through laryngological literature, I have failed to find that any device similar to my clamp has ever been suggested or employed for the purpose of controlling uvular hæmorrhage. Dr. Löri,* of Budapest, is reported to have used a miniature instrument shaped like a "paper-clip" to seize and draw the velum forward during the performance of posterior rhinoscopy. I have modified my clamp during the past year, and several instrument-makers—among them Snowden, of Philadelphia—have endeavored to improve upon the original clamp, but thus far without success.

Malgaigne† says "that on one occasion, after Lisfranc removed the uvula, there was an alarming hæmorrhage. Astringent gargles, ice, and cauterization with nitrate of silver, were all tried and failed. Lisfranc then took the end of the uvula between the branches of a pair of ordinary forceps, and applied nitrate of silver to the wound rendered bloodless by the compression; this succeeded as if by magic, no more hæmorrhage occurring."

Gueneau de Mussy‡ mentions the case of an old man whose uvula he had partially excised to relieve sudden suffocative seizures caused by an hypertrophied uvula as large as the little finger. The operation demonstrated that there was thickening of all the tissues, and a large gaping artery spurted blood from the center of the wound at considerable distance. The hæmorrhage ceased after compression by the forceps and the use of astringent gargarisms, but during the day returned with such violence that the patient filled a wash-basin, holding sixty-four ounces, with blood. The actual cautery was then applied to the bleeding surface and the hæmorrhage permanently checked.

Dr. E. Fournié* reports a case of hæmorrhage following uvulotomy in an abbot superior of a seminary. He does not state the patient's age. The throat was uniformly red; mucous membrane swollen and everywhere thickened. The uvula was also prodigiously enlarged, measuring

* Voltolini, "Rhinoscopie und Pharyngoscopie," 1879, p. 17; see also Mackenzie, *op. cit.*, vol. ii, p. 252.

† "Revue méd.-chir.," Paris, ii, 1847, p. 340.

‡ "Traité de l'angine glanduleuse," Paris, 1857, pp. 75, 76.

* "Revue méd. franç. et étrang.," 1884, i, p. 437.

2½ by 1½ ctm., and the tissues were hard. Silver nitrate in solution was applied daily, and then about half of the uvula was excised, using a grooved forceps with curved scissors. There was no bleeding and no acute pain, the surface was cauterized with a mild solution of silver nitrate, and the patient instructed to gargle with vinegar and water. Four hours afterward the patient was found to be and to have been losing blood from the cut surface. It escaped drop by drop, and almost by jets, and was arterial. Perchloride of iron was applied and held against the bleeding part, but the bleeding recurred. The uvula was then grasped with the dressing forceps, perchloride of iron being still applied. On removal of forceps, the bleeding again recurred. A nasal polypus forceps, slightly curved at its ends, and broad enough in the bite to compress the entire remainder of the uvula against the palatine vault, was next applied, for twenty minutes. No bleeding then taking place, the patient attempted to walk to his room, but fainted. He was soon revived by cordial, and no more bleeding occurred.

Spagnolo * reports a case of persistent hæmorrhage after uvular excision occurring in the practice of Dr. Zambaco, of Constantinople. The resulting hæmorrhage was by some held to be responsible for the death of the patient under a "*post hoc ergo propter hoc*" species of reasoning. The patient had long suffered with inflammation of the throat, increased by every change of temperature. Dr. Zambaco, of Constantinople, Louis, Andral, Ricord, and Tardieu were consulted in this case. Zambaco and these eminent Parisian physicians recommended excision of the uvula. Zambaco cut it off with scissors. A slight bleeding followed, but ceased after gargling with cold water. Four hours later bleeding recurred, and ceased when iron perchloride was freely applied. Next day there was gastric cramp, with intestinal colic, and bloody stools. The perchloride was again applied to the wound and bleeding stopped. The patient was very anæmic. An intense diarrhœa supervened subsequently, and he died eight days after the operation. The reporter says that the patient wore an artificial denture, taking it out at night, and he thinks that the habit of suction acquired by those who wear the dentures produced the hæmorrhage. There is a question whether so much bleeding from the bowels could have originally come from the uvula through the swallowing of blood. There was no autopsy to show the real cause of death.

Carlo Labus's cases †: "The first case was a contractor, aged thirty, of robust constitution, who had been suffering for three years with a dry, irritating cough, caused by an elongated uvula.

"The hæmorrhage which followed the operation, and which in several hours had nearly ceased, recommenced toward evening and steadily increased.

"The next day, the hæmorrhage continuing, I employed a spray of the

* "L'Union méd. d'Orient," Constantinople, No. 24, 1880; also "London Med. Record," 1881, ix, p. 24.

† Personal communication to the writer from Dr. Carlo Labus, of Milan, Italy.

tr. chloride of iron, which arrested momentarily the bleeding, but it soon began again. I then touched the cut surface with a crayon of silver nitrate, but without success. Finally, by means of the galvano-cautery, I arrested the hæmorrhage. As a predisposing cause, I can only cite the plethoric constitution of the patient. The operation was performed by means of the scissors.

"The second case was a man of fifty years, and, like the former, of good health. I performed uvulotomy on account of a chronic pharyngitis.

"The blood continued to flow drop by drop, notwithstanding the application of ice, for three days, yet the patient suffered no great inconvenience. This operation was also performed by means of the scissors."

Dr. Felix Semon's case*: "A man of fifty-five, strong, and of florid complexion, was operated at St. Thomas's Hospital, London, for a long and very thick uvula, which apparently produced an incessant dry cough.

"The hæmorrhage was primary, lasting from 3 P. M. until 6 A. M. next morning, was rather considerable in quantity, and was of a parenchymatous character.

"The bleeding stopped spontaneously, after all possible local hæmostatics, such as alum, tannin, iron perchloride, gallic acid, ice, galvano-cautery at dull-red heat, had failed.

"The man stated that he had always bled considerably when slight operations, extraction of teeth, etc., had been performed on him, and that he was sometimes subject to epistaxis, but no definite history of hæmophilia, either in him or in other members of his family, could be elicited.

"M. Mckenzie's uvulotome was the instrument used, and the cough was not relieved by the operation."

Dr. Morell Mackenzie's case†: "A man of about sixty years was operated for an elongated, not broad, uvula by means of a special form of blunt-pointed scissors. The bleeding was primary, and lasted from twelve noon until nine that night, and from one to two pints of blood must have been lost. Ice and the electric cautery were tried in vain. Attempts were made to tie the stump; but the ligature always came off. The hæmorrhage finally ceased of its own accord. I could see no particular cause for the bleeding. This is the only case I have ever met with, and it occurred in 1865 or 1866, before I was acquainted with the efficacy of a mixture of gallic and tannic acids, when swallowed, in checking all bleeding from the throat."

J. H. Hartman's‡ cases: The first patient was a female, twenty-six years of age, upon whom uvulotomy was performed with Elsberg's uvulatome for elongation. The hæmorrhage was primary, lasted all day, and

* Personal communication to the writer from Dr. Semon, of London, Eng.

† Personal communication to the writer from Dr. Morell Mackenzie, of London, England.

‡ Personal communication to the writer from Dr. Hartman, of Baltimore, Md.

was finally controlled by the galvano-cautery. There was no assignable cause for the bleeding which was arterial.

The second patient was a man of thirty-five years, also operated for an elongated uvula by means of Browne's uvula scissors, and in whom the bleeding was secondary. It was checked in three hours by applications of iron subsulphate. Bleeding arterial.

Dr. Hartman also sends the record of a patient who bled copiously for one hour succeeding operation.

Dr. D. Bryson Delavan,* of New York, reports the following case: "A male patient, aged forty-five, married, and an American, was operated on for elongation of the uvula. This elongation caused distressing paroxysms of cough (particularly upon his lying down), as well as insomnia, vomiting, great general disturbance, and pharyngo-laryngeal irritation. The hæmorrhage was primary, lasted about four hours, the patient becoming pale and pulse weak, probably as much from nervousness as from loss of blood. The actual amount of blood lost is unknown. Silver nitrate applications controlled the hæmorrhage. The patient was excited at the time of operating, and the vessels of the uvula and pharynx were congested. He died six months later from chronic interstitial nephritis. The instrument employed was Elsberg's ring uvulatome."

Dr. D. N. Rankin's cases†: "The first case was a male, aged thirty, a resident of Alleghany, Pa. He had, for several months previous to calling on me for advice, been troubled with an irritable cough, without expectoration. This was early in 1884. Upon examination of the throat, I discovered an extensive elongation of the uvula, sufficient to cause the cough, and advised abscission to relieve it. The operation was done with the uvulatome, after which I prescribed an astringent gargle. The operation was performed about 2 P.M. In the evening, about six o'clock, the patient hurriedly sent for me. When I arrived at his home he was bleeding quite freely from the excised uvula; the cut surface was touched with solid nitrate of silver, it failing to check the bleeding. I then advised him to keep a piece of ice to the bleeding point. Hot water was used; an attempt to use the galvano-cautery was made, but, as is usual when you want to use the cautery in an emergency, it does not work satisfactorily. With the Monsel's solution and ice the hæmorrhage, after continuing incessantly for thirty hours, was checked. As to the amount of blood lost it was impossible to ascertain, as he doubtless swallowed a large quantity of it. No pulsation in the uvula was noticed, else I would most certainly have ligated the uvula near its base. No hypertrophy, merely elongation. No hæmorrhagic diathesis."

"The second case was a male, aged about thirty-five years, a resident of Alleghany. When he presented himself at my office he was suffering

* Personal communication to the writer from Dr. Delavan, April, 1886.

† Personal communication to the writer from Dr. Rankin, of Alleghany, Pa.

from difficult breathing. Upon examination of the throat, I discovered great œdema of the uvula. It was at once scarified. This giving him no relief, it was almost entirely abscised with forceps and scissors. Little hæmorrhage occurred immediately after the operation, which was made about 2.30 P. M. Hæmorrhage commenced next day at noon, and continued incessantly for twenty-four hours, notwithstanding ergot, internally, and astringent gargles were used. Finally, after using hot-water gargles, it was checked. I can not estimate the amount of blood lost, but it was very great."

Dr. Joseph E. White's case*: "The patient was Dr. William M. T., of Culpepper, Va., who, in 1878, was suffering from naso-aural catarrh, with some hypertrophy and relaxation of the mucosa. The uvula was hypertrophied and elongated, and was a great annoyance from the constant tickling it caused in the throat. I clipped it about 11 A. M.: the bleeding ceased in a few moments, and he went back to his boarding-house to write to his wife. At one o'clock I went to my clinic at the City Hospital, and whilst there the doctor came in bleeding profusely, spitting up mouthful after mouthful of blood. He told me that while writing to his wife he hawked once or twice violently to dislodge some mucus in his throat, and, as a result, commenced bleeding. When I tried to examine his throat I found the blood flowing so rapidly that it was difficult to get a view of the uvula. I tried ice, the perchloride of iron, and a saturated solution of tannic and gallic acids without avail, alternated with attempts at compression with a pair of forceps (which latter made him sick whenever they were applied) for more than an hour. As he had then been bleeding profusely for more than two hours, and was much weakened by loss of blood, I resolved to try the actual cautery. As soon as the instrument was red hot I told him to open his mouth, and was in the act of burning the uvula when the bleeding suddenly ceased, and my patient collapsed in a fainting condition. From this he soon rallied, was taken home, put to bed, given a dose of ergot, and advised to continue the use of ice and the mixture of tannic and gallic acids. There was no return of the hæmorrhage afterward."

Dr. E. Brallier's case†: "William A., aged fifty-five, was operated on, October 27, 1885, for an elongated uvula, which was the cause of an annoying tickling cough. The uvula was narrow and not hypertrophied. About three quarters of an inch of the prolapsed organ was removed, a uvulatome made by Kolbe being used. The usual bleeding occurred at the time of operating, but continued until during the night, when it became both copious and alarming. The patient was finally exhausted from the hæmorrhage, which continued sixteen hours, with a loss of at least two quarts of blood. Astringents and stypties were used without avail,

* Personal communication to the writer from the operator, Dr. White, of Richmond, Va.

† Personal communication to the writer from Dr. Bralher, of Chambersburg, Pa.

but compression with the forceps and cauterization controlled the bleeding. From the slight spurting and light color of the blood issuing from the stump, there is no doubt of its being arterial."

Dr. J. G. Carpenter's case*: "Male patient, aged thirty-five, operated for elongation with forceps and scissors.

"The bleeding was primary, quite copious, lasted twenty-four hours, and was finally checked by employing pressure, stypties, ice, and hypodermics of morphia and atropia.

"This patient was suffering from a chronic naso-pharyngeal catarrh, and was operated during an acute exacerbation of the same."

Dr. Carpenter states that the doctor who operated was not a graduate of medicine, and that the uvula was completely removed, which resulted in the frequent regurgitation of solids and liquids through the nasal passages.

Fatal case furnished by Dr. Meyer†: "Erich, an earl, the son of Hakon, was on his way to Rome, but died in England from an uncontrollable hæmorrhage which resulted from cutting his uvula."‡

This case probably occurred in 1035, and the foregoing is a free translation by me from the original Latin,# which I have found and which reads as follows: "Dynasta Eirikus Hakonis filius, cum itineri Romam accinctus esset, in Anglia obiit; is, secta uvula, cum sisti sanguinis nequiret, mortem appetiit."

The operator's name, the age of the earl, and other interesting data are wanting.

Dr. Baratoux's cases‖: "A lawyer of fifty, of rheumatic diathesis, the subject of cardiac disease and of occasional cerebral congestions, was operated with Warren's scissors.

"His uvula was greatly elongated, reaching to the superior border of the epiglottis, which it tickled. The vessels of the pharynx were varicose. The bleeding was primary, lasted half an hour, and was arrested by penciling with a solution of zinc chloride.

"The second case was a male, of thirty-six, operated by the galvano-cautery loop for prolapsus, and the presence of three polypi on the extremity of the uvula. Copious secondary hæmorrhage occurred, lasting three hours, and was checked finally by forceps, pressure, and zinc chloride applications.

"Third case, a female of forty, operated for an hypertrophied uvula by means of a polyptome with cold wire. Bleeding lasted several hours and was stopped by the galvano-cautery."

* Personal communication to the writer from Dr. Carpenter, of Stanford, Ky.

† Personal letter from Dr. Wilhelm Meyer, of Copenhagen, to Dr. William H. Daly, of Pittsburgh, and published for the first time, with the latter's consent.

‡ "Knytlingasaga," chapt. xvi, 1828, p. 200.

"Scripta historica Iclandorum," etc., Hafniæ, 1842, ch. xvi, 188.

‖ Personal communication to the writer from Dr. J. Baratoux, of Paris.

I decided to include Baratoux's three cases in my essay, although it is evident that neither of them possesses that interest characterizing the twenty other reports.

Dr. J. O. Roe's case:* "Mrs. L., aged twenty-five years, married. Has had most of the time, for several years, an irritating cough and an inclination to swallow frequently.

"Three years ago she had a mild attack of diphtheria, which left her throat sensitive to dust, damp air, etc., and she has since been hoarse quite often. An examination revealed a greatly elongated uvula, a chronic granular pharyngitis, and a chronic laryngitis.

"The uvula was quite thick and so long as to lie on the base of the tongue, and to touch the upper border of the epiglottis. I advised shortening the uvula by uvulotomy and local treatment to the pharynx and larynx. Accordingly, I removed the elongated portion of the uvula with a pair of straight uvula-scissors, having their points curved inward to prevent the uvula from slipping out on being cut. The uvula was left, after the operation, fully its normal length.

"Very little hæmorrhage followed the uvulotomy, and the patient in a short time left my office for her home. Soon after, however, I was called hastily to see her on account of profuse hæmorrhage that was taking place from the cut surface. Ice and the application of subsulphate of iron had no effect to control the hæmorrhage, and I only succeeded in arresting it by grasping quite firmly the stump of the uvula with a pair of large sized dressing forceps.

"These were retained on the uvula for about three hours, after which there was no recurrence of the hæmorrhage."

Having described the clinical histories of these unusual cases, I desire to bring to your notice the results of my literary research regarding the question of hæmorrhage following uvulotomy. With a view of making the present paper exhaustive, I addressed six hundred copies of the following letter to the laryngologists of the world, as well as to the more prominent surgeons and practitioners of medicine in this country, asking their experience in the matter of hæmorrhage after uvulotomy.

918 E Street, Northwest, Washington, D. C., *April 1, 1886.*

My dear Doctor: I have been recently investigating the subject of obstinate hæmorrhage following uvulotomy. My purpose is to collect the interesting *unrecorded* and *recorded* examples of this rare accident and to publish them in the form of a monograph. In case you have met with such hæmorrhage, may I ask you to aid me in this undertaking by answering and returning the accompanying questions to my address? Brief details of cases of hæmorrhage following uvulotomy occurring in

* Personal communication from Dr. J. O. Roe, of Rochester, N. Y.

your own practice or the practice of others, as well as any references to medical literature, will be greatly appreciated by

Yours respectfully,

E. Carroll Morgan, M. D.,

Fellow of the American Laryngological Association, Professor of Laryngology, Med. Dept., University of Georgetown, Washington, D. C.

1. State age, sex of patient, etc. 2. For what reason was uvulotomy performed? 3. Was the bleeding primary or secondary? 4. What was the duration and extent of the bleeding? 5. How was the bleeding finally controlled? 6. Was there an assignable cause for the bleeding? 7. What instrument was employed in operating?

The prevailing opinions of these gentlemen are reflected in my essay to-day, and I take this opportunity to express appreciation of their prompt response to my call for information. The widely scattered examples of uvular hæmorrhage have, for the first time in the history of medicine, been collected and added to the unrecorded cases, which I secured by the above-mentioned letter.

I wish at this point to state emphatically that my present investigation was not inspired by any desire to play the rôle of alarmist regarding uvular hæmorrhage, but, on the contrary, to present the subject in its true light, and to record the numerous examples of this rare accident hitherto ignored.

Those who would excect, as also those who would not even clip, a uvula may find little comfort in my studies; for the conclusions therefrom do not lead me to espouse the opinions of either class of extremists.

Death has resulted from bleeding after excision of the uvula in one instance,* and the bleeding in Zambaco's† patient probably hastened the fatal termination of a chronic disease. It appears from the Hippocratic‡ and other# treatises that excision of the uvula was occasionally performed in early times. There is, according to my reading and interpretation, evidence to prove that Hippocrates‖ was at one time in the habit of amputating uvulæ by means of his finger-nails, although he also employed cutting instruments. Celsus^ seized as much of the organ as he deemed it advisable to retain with a pair of forceps, and cut below the instrument. Fabricius ab Aquapendente◊ excised with scissors only, and applied a heated (not

* Read Meyer's report, cited above, which I have verified. † *Op. cit.*

‡ "Prognost. de morbis," ii, De affect.

Aretæus, Περὶ αἰτίων καὶ σημείων, κ.τ.λ., fol., Lugd. Bat., 1735, cap. viii, p. 7.

‖ Lisfranc, "Revue méd.," Paris, 1823, vol. xi, p. 241.

^ *Op. cit.*, vii, 12. ◊ *Op. cit.*

incandescent) spoon to the bleeding stump. No obstinate hæmorrhage is mentioned by these authors. Albucasis,* Avicenna,* and Oribasius,* also Aetius,* removed the uvula by cutting instruments. Some of the older surgeons surrounded their operations upon the uvula with great ceremony, and a regard for details quite praiseworthy. Paulus Æginetа,† for example, was accustomed to employ instruments expressly made for this operation: a staphylagrum to hold the uvula, a staphylatome to divide it, and a staphylacaustum to cauterize the wound. Galen,‡ Mesué,* Nuck,* and Boss * seem to have belonged chiefly to the expectant school, ignoring surgical procedures in treating elongated uvulæ, the three latter advising traction upon the hair of the head to such a degree as to tear the skin from the cranium. This traction was accomplished by tying the hair up in a ribbon near its roots, and twisting until a top-knot was formed. It may not be generally known that, even to this day, the southern negroes resort to the above-described method with implicit faith in its never-failing power to raise the palate. I find that Mesué‖ also directs the operation to be performed with a heated scalpel of gold. During the reigns of Antonius and Serverus, Aphrodesia violated the public confidence and made himself famous by seeking to inspire the fear that those persons who suffered excision of the uvula at its base would always die of consumption.△ Cauterization◊ is first mentioned by Demosthenes, of Massilia. The Arabians‡ destroyed uvulæ by caustic and by the red-hot iron. Paré‡ used the ligature, and the two Fabricii,‡ at various periods, scissors, caustic, and ligature.

M. Tholozan,** in a note upon excision of the uvula by Persian barbers, says:

"In the districts of Semnan and Firouz-Kouh, situated five days' march to the east of Teheran, excision of the uvula is practiced by the Persian barbers on nearly all the children, as a prophylaxis of inflammation of the throat. They use a strong wooden spatula and a thick steel rod, whose sharp end is curved on the flat or shaped sometimes as a com-

* Chelius's "Surgery," translation by South, Philadelphia, 1847, i, p. 167.
† Velpeau, "Operative Surgery," iii, New York, 1847, p. 385.
‡ "De med. sec. loc.," vi.
* Velpeau, "Operative Surgery," New York, 1847, iii, p. 385.
‖ De ægr. gutturis, 3.
△ "Revue méd. franç. et étrang.," Paris, 1823, xi, p. 241.
◊ Chelius, *op. cit.*, p. 167.
‡ *Op. cit.*
‡ *Op. cit.*
‡ *Op. cit.*
** "Bull. de l'Acad. de méd.," 1884, p. 8.

plete ring, seven to eight mm. in diameter. They are so constructed as not to endanger neighboring parts. The barber passes the spatula rapidly into the throat and presses it from behind forward against the uvula. He then applies the cutting instrument to the concavity of the uvula produced by the pressure of the spatula. The uvula is then cut by pressure combined with lateral movements. The piece cut off is withdrawn by the two instruments held in juxtaposition. They practice this operation very dexterously, charging for it a few centimes. Women practice it also in the harem. The practice dates back many generations. It is usually done at the age of one, two, or three years. In addition to preserving them, as they suppose, from danger of frequent and severe sore throats, they think the danger of suffocation is lessened. No accident seems to occur in connection with this operation. The practice is confined to the districts mentioned; inflammation and catarrh of the throat are very frequent here."

"The cutting of the uvula has been customary in the northern provinces of Iceland,* if not over the whole country, from the earliest times. The operation, as a rule, is performed during childhood; if not then, later in life. The operation is performed partly because it is supposed to be able to prevent diseases of the throat, and partly because there is a great deal of superstition connected with the results of the operation—for example, in preventing sickness and general indisposition. A merchant from Iceland has told me that he knew a child of seven or eight years, who was very small, and its slow growth was supposed to be caused by the fact of its uvula not having been removed at an early age; the operation was performed in the hope that the child would thrive better in consequence. The same gentleman says he knows that the uvula has been cut in grown-up persons after angina to prevent relapse, but never during the disease. He never heard of any case where an unfortunate result such as hæmorrhage followed the operation. I myself have seen two vela whose uvulæ had been cut away from Ofiord and Husavih, in the north part of Iceland. In both cases the uvula was cut out at the root, and in both it was done in early age (from one to two years), the usual age at which the operation is performed.

"The operation, which is thought as necessary as vaccination, is performed by peasants who are accustomed to do it, and of whom there are one or more in each parish. They do it with an instrument which is a little like Morell Mackenzie's tonsillotome, and the instrument is called Ufvrskaeri and made with great skill by the smiths. The operation is said to have been performed less frequently during the last few years."

Conditions which may or may not influence the occurrence of hæmorrhage after uvulotomy:

* Letter from Dr. Wilhelm Meyer, of Copenhagen, to Dr. William H. Daly, of Pittsburgh.

"*Anomalous Blood-supply.*"—The existence of an anomalous arterial or venous distribution to the velum palati and uvula has never been appreciated as a probable cause of copious hæmorrhage following uvulotomy. In my judgment, several of the cases cited to-day point clearly to a larger artery than commonly supplies the uvula being the source of the bleeding. The vascular supply of the uvula remains even to-day somewhat in a cloudy condition, little that is definite being accessible upon the subject. A necropsy alone can of course decide the existence or non-existence of supernumerary arteries.

Dr. J. W. Farlow,* of Boston, says, in reference to this question of anomalous pharyngeal blood-supply, that he has lately seen three cases in which there were large, pulsating arteries to be seen on the back of the pharynx.

"One girl, aged sixteen, had a very large artery on the left side and a less marked one on the right side of the pharynx about a quarter of an inch inside of the posterior pillar of the fauces."

This case he showed at a medical meeting, and Dr. F. I. Knight and Dr. De Blois have seen it:

"Another case was a girl of twenty-three, only in her the artery was on the right side alone.

"The last case was a woman of twenty-six and was similar to the first, the arteries in both instances being apparently larger than the radial.

"Dr. Thomas Dwight, professor of anatomy in the Harvard Medical School, says that these cases are probably abnormalities of the ascending pharyngeal artery."

Instruments Employed.—Excluding the snare,† the galvanocautery,‡ and the ligature,# and surely these methods are not generally selected in uvular excisions, hæmorrhage results equally from the use of various instruments. The instruments employed in operating on the cases of hæmorrhage reported to-day were the scissors, the bistoury, or the uvulatome; and simply because ninety-nine out of every hundred patients are operated on with the scissors, the bistoury, or the uvulatome. My investigation convinces me that the particular instrument used, with the exceptions noted, is of no im-

* Personal communication to the writer.

† Morgan (E. C.), "The Value of the Snare in performing Uvulotomy," "Maryland M. J.," Balt., September 26, 1885.

‡ Letter from Mr. Lennox Browne, London.

Waters, "System of Surgery," Philadelphia, 1802, p. 317.

portance, so far as bleeding is concerned, for the Persian barbers,* with their crude method in their thousands of operations, have never encountered trouble.

Pathological Condition of the Uvula.—Excessive hypertrophy, or the development of a varicose or "hæmorrhoidal state" of the veins of the organ, assuredly tends to increase the loss of blood following uvulotomy. Most of the cases cited in my paper were instances of uvular hypertrophy, in a few the organ being of enormous dimensions. Operations performed during the existence of acute inflammation, œdema, or ulceration, are more likely to be succeeded by bleeding than operations made for a simple prolapsus. The instances of so-called spontaneous uvular bleeding reported by René Vanoye,† Rudolph,‡ and Würzburger* do not fall within the scope of my studies.

Character of the Bleeding.—After uvulotomy, the bleeding, if persistent, is nearly always arterial, as is evidenced by the color of the blood, the spurting of arteries, or the pulsation of the uvular stump. Venous hæmorrhage is, nevertheless, occasionally noticed.

Supposed Risk of Hæmorrhage in High Operations.—Troublesome bleeding is not necessarily attributable to the removal of too much of the uvula (in prolapsus), for a simple clipping has caused profuse hæmorrhage, while an extirpation was nearly bloodless. I should hesitate to apply this opinion to cases of indurated or hypertrophied uvulæ. My practice is to so operate on a prolapsed or hypertrophied uvula as to restore it as near as possible to its normal proportions. Between the two extremes of complete exsection of the uvula and the let-alone system, I think a middle course exists, and can be pursued with the happiest results. No simple operative procedure is more frequently beneficial than a uvulotomy properly done in proper cases.

Hæmorrhagic Diathesis.—The existence of hæmatophilia would have its influence in rendering bleeding persistent in uvulotomy as in other surgical procedures. It is worthy of special note, however, that in none of my collected cases was there a hæmorrhagic diathesis clearly established.

Final Conclusions.—A fatal or uncontrollable hæmorrhage has in one instance followed a uvulotomy.‖

* Tholozan, "Bull. de l'Acad. de méd.," 1884, p. 8.

† "Ann. de la Soc. méd. d'émulation de la Flandre occident.," 1848, p. 250.

‡ Rust's "Magazin," 1823, xiii, p. 276.

* "Krankheiten der Uvula," Erlangen, 1843, p. 15.

‖ Read Meyer's extract from the "Knytlingasaga," chap. xvi, 1828, p. 200, given above. Since reading this essay to the American Laryngological Associa-

A persistent, obstinate, or alarming hæmorrhage is only encountered in the rarest instances.

A moderate bleeding, ceasing spontaneously or by the use of mild styptics, occasionally happens.

The loss of a few drops of blood at the time of operating, followed by slight oozing, is of common occurrence.

The most reliable surgical methods for controlling uvular hæmorrhage are the ligature, compression by the clamp or forceps, or the use of the galvano or actual cautery.

The most reliable styptics are, in the order named, solid silver nitrate, or iron persulphate directly applied to the bleeding stump, and solutions of gallo-tannic acid, or alum. To these may be added the local use of ice, ice-water, and vinegar.

The most reliable systemic means are opium, lead acetate, sulphuric acid, and ergot.

Bibliography.

Aetius (Amidenus [or Antiochenus]), "Libri xvi in tres tomos divisi, quorum primus et ultimus Jo. Bapt. Montano . . . secundus Jano Cornario Zuiccaniensi . . . interpretibus Latinitate donati sunt." 3 t. in 1 v., fol., Basileæ, 1535.

Agnew (D. Hayes), "The Principles and Practice of Surgery." 3 vols., 8vo. Philadelphia, 1878–'83.

Albucasis, "De chirurgia. Arabice et latine." Cura Johannis Channing. 3 t. in 1 v., 4to. Oxford, 1778.

Ashhurst (J.), "The Principles and Practice of Surgery." Third edition, 8vo. Philadelphia, 1882.

Avicenna, "Arabum medicorum principis. Ex Gerardi Cremonensis versione, et Andreæ Alphagi Bellumensis castigatione. A Joanne Costæo, et Joanne Paulo Mongio annotationibus iam pridem illustratus. Nunc vero ab eodem Costæo recognitus, et novis alicubi observationibus adauctus. . . . Vita ipsius Avicennæ ex Sorsano Arabe eius discipulo, a Nicolæo Massa latine," etc. 2 v. in 1, fol. Venetiis, 1595.

Ballet (Gilbert), "De l'œdème suraigu suffocant de la luette." "France méd.," Par., No. 27, 1885.

Bosworth (Francke H.), "Diseases of the Throat and Nose." 8vo. New York, 1881.

Browne (Lennox), "The Throat and its Diseases." 1 vol., 8vo. Philadelphia, 1878.

Browne (Lennox), "On the Effect of Removal of the Uvula on the Voice." "Brit. M. J.," London, 1880, ii, p. 766.

tion, I have been convinced by research that the case referred to in Dr. Meyer's letter is authentic. I therefore admit the case to my paper.

Browne (L.) and Behnke (E.), "Voice, Song, and Speech." 8vo. London, 1885.

Bryant (Thomas), "A Manual for the Practice of Surgery." Fourth edition, 12mo, 2 vols. London, 1884.

Butcher (Richard G.), "Essays and Reports on Operative and Conservative Surgery." 4to. Dublin, 1865.

Carter (C. H.), "Œdema Uvulæ threatening the Life of the Patient." "Med. News," Philadelphia, 1883, xlii, p. 354.

Celsus (Aurelius Cornelius), "On Medicine," in eight books. Latin and English. Translated from L. Targa's edition, the words of the text being arranged in the order of construction, with explanatory notes, etc., by Alexander Lee. 2 vols. in 1, 8vo. London, 1831.

Cohen (J. Solis-), "Diseases of the Throat." 1 vol., 8vo. New York, 1879.

Cohen (J. Solis-), "The Throat and the Voice." Philadelphia, 1879.

Cooper (Sir Astley), "Lectures on the Principles and Practice of Surgery." Eighth edition, 8vo. London, 1837.

Dartigolles (U.), "Sur un cas de polype muqueux de la luette." "Mém. et bull. de la Soc. de méd. et chir. de Bordeaux" (1884), 1885, pp. 131–133.

Delpech (Jacques Matthieu), "Chirurgie clinique de Montpellier." 2 vols., 4to. Paris et Montpellier, 1825.

Desault (P. J.), "The Surgical Works," etc. 2 vols., 8vo. Philadelphia, 1814.

Dorr (T. C.), "On Amputation of the Uvula as a Remedy for Reflex Irritation." "Am. M. Weekly," Louisville, 1876. v, pp. 113–115.

Druitt (Robert), "The Principles and Practice of Modern Surgery." 8vo. Philadelphia, 1847.

Durant (G.), "Hygiene of the Voice." 12mo. New York, 1879.

Editorial, "Excision partielle de la luette; imprudences multiples; mort." "Union méd. d'Orient," Constantinople, 1880, vii, p. 195.

Erichsen (John Eric), "The Science and Art of Surgery." 2 vols., 8vo. Philadelphia, 1873.

Fabricius ab Aquapendente, "Opera chirurgica, quorum pars prior pentateuchum chirurgicum, posterior operationes chirurgicas continet. Item de abusu cucurbitularum in febribus putridis dissertatio." Fol. Lugduni Batavorum, 1723.

Fournié (Ed.), "Physiologie de la voix et de la parole." 8vo. Paris, 1866.

Fournié (E.), "Complications qui peuvent accompagner la section de la luette; hémorrhagie, angine pultacée." "Rev. méd. franç. et étrang.," Par., 1884, i, pp. 437–440.

Galen (Claudius), "Opera omnia." Ediderunt Andreas Asulanus et J. B. Opizio. 5 v., fol. Venetiis, 1525.

Gant (Frederick James), "The Science and Practice of Surgery. Third edition, 2 vols., 8vo. London, 1886.

Garin (——), "Apoplexie de la luette." "Gaz. d. hôp." Par., 1853, 19.

Gibb (G. D.), "On Diseases of the Throat and Windpipe." Second edition, 12mo. London, 1864.

Gibb (G. D.), "Letter on the Uses of the Uvula." "Lancet," Lond., 1872, i, pp. 180–182.

Gross (Samuel D.), "A System of Surgery." 2 vols., sixth edition. Philadelphia, 1882.

Gueneau de Mussy, "Traité de l'angine glanduleuse." 8vo. Paris, 1857.

Heister (Laurenz), "Chirurgie." 4to. Nürmberg, 1770.

Hemming (W. D.), "Throat Diseases," etc. London, 1881.

Hippocrates, "Opera quæ extant. Græce et latine . . . scholiis illustrata, a Hieron. Mercuriali." 2 v. in 1, folio. Venetiis, 1588.

Hippocrates, "Opera omnia quæ extant." In viii sectiones ex Erotiani mente distributa, nunc recens latina interpretatione donata, ac denuo separatim in lucem edita, Anutio Fœsio. Adjecta sunt ad vi selectionem Palladii scholia in lib. de fracturis, nondum, etc. 8vo. Francofurti, 1596.

Holmes (Gordon), "Treatise on Vocal Physiology and Hygiene." London, 1879.

Holmes (T.), "A System of Surgery." 4 vols., 8vo. London, 1860.

James (P.), "Sore Throat." Philadelphia, 1880.

Kleinschmidt (C. H. A.), "Papilloma of the Uvula." "Trans. of the Med. Soc. of the Dist. of Columbia"; "J. of the Am. M. Assoc.," vol. vi, No. 10, 1886, p. 272.

Knytlingasaga, "Kaupmannahafn," 1828, ch. 16, 200.

Labus (Charles), "L'hypermégalie et la paralysie de la luette." 8vo. Milan, 1882.

Knox (R. W.), "The Uvulatome." "Med. News." Philadelphia, 1884, xliv, p. 229.

"Laryngitis after Snipping the Uvula, Laryngotomy, Recovery." "Assoc. Med. Journal," vol. ii, 1857, p. 803.

Lisfranc (J.), "Considérations anatomiques, physiologiques et pathologiques sur la luette." "Rev. méd. franç. et étrang.," Paris, 1823, xi, pp. 233–245.

Lisfranc (J.), "Excision de la luette." "Rev. méd.-chir. de Par.," 1847, ii, 347.

Mackenzie (Morell), "Diseases of the Pharynx, Larynx, and Trachea." 2 vols., 8vo. Philadelphia, 1880.

Malgaigne (J. F.), "Operative Surgery." 8vo. Philadelphia, 1851.

Mandl (L.), "Maladies du larynx et du pharynx." 8vo. Paris, 1872.

Martini (L.), "L'ugola e le sue funzioni." "Osservatore," Torino, 1879, xv, pp. 289–293.

Mesué (Joannes), "De medicamentorum purgantium delectu, castigatione, et usu, libri duo." 2 v. in 1, fol. Venetiis, 1581.

Morgan (E. Carroll), "The Value of the Snare in performing Uvulotomy." "Maryland M. J.," Baltimore, vol. xiii, No. 22, 1885, p. 423.

Morgan (E. Carroll), "Remarks on Papilloma of the Uvula." "Trans. of the Med. Soc. of the Dist. of Columbia"; "J. of the Am. M. Assoc.," vol. vi, No. 10, 1886, pp. 272, 273.

Müller (——), "Manuel de physiologie," 1851.

Nuck (Antonius), "Operationes et experimenta chirurgica." Sm. 8vo. Lugduni Batavorum, 1696.

Oribasius, "Collectorum medicinalium, libri xvii, qui ex magno septuaginta librorum volumine ad nostram ætatem soli pervenerunt." Joanne Baptista Rasario interprete. 16mo. Parisiis, 1555.

Paré (Ambroise), "Œuvres complets. Revus et collationnés sur toutes les éditions, avec les variantes," par J. F. Malgaigne. 3 vols., 8vo. Paris, 1840–'41.

Pauli (——), "Floeser's Repertorium." Tome ii, No. 6.

Paulus Ægineta, "The Seven Books of . . . ." Translation from the Greek, etc. 3 vols., 8vo. London, 1844–'47.

Physick (Philip Syng), Case of obstinate cough occasioned by elongation of the uvula, in which a portion of that organ was cut off, with a description of the instrument employed for that purpose, and also for excision of scirrhous tonsils. "Am. J. of the Med. Sci.," Philadelphia, 1827, i, 262–265, 1 pl.

Pirrie (William), "The Principles and Practice of Surgery." 4to. London, 1860.

Purves (R.), Letter on the Uses of the Uvula. "Lancet," London, 1872, i, p. 271.

Rankin (D. N.), "Excessive Elongation of the Uvula." "Archiv. of Laryngol.," vol. i, No. 2, p. 161.

Rhazes (Abu-Beker-Mohammed), "Opera parva Abubetri filii Zacharie filii Arasi." Sm. 4to. Lugdunum, 1511.

Roux, "Œdème suraigu suffocant de la luette." "J. de méd. et chir. prat.," Paris, 1885, lvi, p. 405.

Rudolph (——), "Blutung aus der Uvula." "Mag. f. d. ges. Heilk.," Berlin, 1823, xiii, p. 276.

Rumbold (T. F.), "The Function of the Uvula and the Prominence formed by the Azygos Uvulæ Muscles." "St. Louis M. and S. J.," 1876, n. s., xiii, pp. 617–627.

Sajous (Charles), "Diseases of the Nose and Throat." 8vo. Philadelphia, 1885.

Schech (——), "Diseases of the Mouth, Throat, and Nose." Blaikie's translation, Edinburgh, 1886.

"Scripta historica Islandorum," etc. Hafniæ, 1842, ch. xvi, 188.

Seiler (Carl), "Diseases of the Throat, Nose," etc. Philadelphia, 1883.

Semon (Felix), "The Throat Department of St. Thomas's Hospital in 1882." 8vo. London, 1884.

Shufeldt, (R. W.), "Two Uvulæ in a Man." "N. York M. J.," 1885, xli, p. 723.

Shurly (E. L.), "A Plea for the Uvula." "Detroit Lancet," Jan., 1881, p. 295.

Smith (E. N.), "Removal of the Uvula." "Brit. M. J.," London, 1872, i, pp. 125, 126, 311.

Spengler (Dr.), "Apoplexia Uvulæ." "Deutsche Klinik," Berlin, 1854, vi, pp. 7, 8.

Susrutas, Ayur-Védas: id est medicinal systema a venerabili D'hanvantare demonstratum a Susruta discipulo compositum. Nunc primum ex Sanskrita in Latinum sermonem vertit, introductionem, annotationes et rerum indicem adjecit Dr. Franciscus Hessler. 3 vols. in 1. Royal 8vo. Erlangæ, F. Enke, 1844–'50.

Tholozan (——). "Note sur l'excision de la luette par les barbiers persans." "Bull. de l'Acad. de méd.," Paris, 1884, 2 s., xiii, p. 8–10.

Tompkins (W. W.), "Sudden Death, following Excision of the Uvula." "Med. Rec.," New York, vol. xxix, No. 25, 1886, p. 706.

Treves (Frederick), "A Manual of Surgery." 3 vols., 12mo. London, 1886.

Vanoye (René), "Cas rare d'hémorrhagie." "Ann. de la Soc. méd. d'émulat. de la Flandre occid.," Roulers, 1848, pp. 250, 251.

Velpeau (Alf. A. L. M.), "Operative Surgery." 3 vols. New York, 1847.

Voltolini, "Anwendung der Galvanokaustik im Innern des Kehlkopfes und Schlundkopfes." Vienna, 1867.

Voltolini, "Rhinoscopie und Pharyngoscopie." 1879.

Würzburger (Dr.), "Ueber die Krankheiten der Uvula." 29 pp., 1 pl. 8vo. Erlangen, 1843.

Zambaco (——), "L'union méd. d'Orient," Constantinople, No. 24, 1880.

It now becomes my pleasant duty to acknowledge the substantial assistance and advice extended to me during the preparation of this paper by Dr. J. S. Billings, Dr. Robert Fletcher, Dr. Thomas Wise, Dr. J. C. McConnell, Dr. D. S. Lamb, and Professor Apel, of the Surgeon-General's Office, Washington.

Discussion.

Dr. Hooper: I have never seen a bleeding of more than a few drops follow this operation. I never cut through the muscle, but merely remove the redundant mucous membrane. It is with me, however, an infrequent operation—about once in one hundred and sixty-five cases of throat disease.

Dr. Mackenzie: I can not add much to the admirable historical account given by the author of the paper beyond the fact that a record exists of the operation having been performed long anterior to Hippo-

crates and his school. I think that there is in the "Ayur-Véda" an account of the removal of the uvula; they certainly had instruments for the removal of the tonsils, which are clearly described. And I think that they also used the same instrument for the removal of the uvula. It is certain, however, that they removed nasal polypi with the forceps.

Dr. De Blois: An anomalous distribution of the arteries has been assigned as a possible cause of hæmorrhage after staphylotomy, and a case has been reported. I do not think that the arteries alone are at fault. A short time since I saw the two cases which were reported to Dr. Morgan by Dr. Farlow. One was a young girl of sixteen, in whose pharynx the pulsation was noticed, on looking into the throat, behind each posterior pillar of the fauces. The second was a young man, who had a large pulsating artery in the pharynx, involving one side only. It is very curious that both of these patients were seen within a week. Where such a condition of the vessels exists, it is an alarming complication in case of incision for retro-pharyngeal abscess.

Dr. Delavan: I have seen four cases in which this anomalous distribution of the arteries existed, and in all of them it was distinctly marked.

Dr. Donaldson: I was much interested in Dr. Morgan's valuable paper. I am astonished to learn the number of cases of hæmorrhage after the operation. In my own experience I have never had more than a few drops of blood flow. The necessity seldom exists for cutting off the uvula, and the operation should rarely be done. The popular idea that a relaxed and elongated uvula usually causes a cough is erroneous. The chief inconvenience from it is, that it produces difficulty in deglutition by interfering with the ascent of the soft palate. Moura found, as a result of his investigations, that the uvula is of great service in shutting up the chink in the naso-pharynx during the second period of deglutition. This function may be seriously impaired by its removal. It is very seldom that it is necessary to use the uvulatome, and then only a small portion should be excised. Numerous cases have occurred where the uvula has been much enlarged, but where the swelling has disappeared entirely after astringent treatment. The uvula in rare instances descends over the epiglottis.

Dr. Daly: I hope that the paper of Dr. Morgan will be extensively read by the profession, in order to check the tendency of uselessly operating upon the uvula. The aim should be, in any operation, to leave the parts in as nearly a normal condition as possible, and I am, therefore, opposed to a truncate incision in removing the uvula. It should be left in an inverted wedge-shape. I have been very much disgusted with the amount of malpractice which has been perpetrated upon this little organ. In my entire experience of many years of active throat practice I have not found it necessary to amputate the uvula more than three times. That the operation is sometimes necessary I am prepared to admit; but it

should be done as rarely as possible. It has been resorted to by practitioners when they did not know what else to do; under such circumstances it is wrong.

Dr. MORGAN: On closing this discussion I wish to express my appreciation of the general approval by the members, and the kind words spoken by the president, relative to the worth of my present essay. My investigation of the question of hæmorrhage following uvulotomy, which has consumed fourteen months, was inspired by a desire to ascertain the facts appertaining to this important and interesting matter; facts which have transpired and, for unaccountable reasons, have never been recorded. The development of the subject under systematic methods has astonished me, as it has others, and a mass of valuable material has ultimately been accumulated. In the investigation of the subject I soon found that medical literature, with three notable exceptions, was silent upon and apparently unaware of the occasional occurrence of dangerous bleeding after uvulotomy, and for this reason I was forced to resort to the circular letter. The responses received from home and abroad were general, and nineteen of the twenty-three cases of hæmorrhage collected are for the first time reported to-day. The utmost caution has been exercised in admitting only undoubted instances of uvular hæmorrhage to the paper, consequently numerous cases have necessarily been excluded. A colleague sent the history of a patient upon whom he had performed a double tonsillotomy and a uvulotomy at one sitting, and expressed the belief hough not absolutely certain that the subsequent copious bleeding was from the uvula. For obvious reasons this case has been excluded. I am of the opinion that the errors of omission and commission existing in recent works on diseases of the throat concerning uvular hæmorrhage should be corrected, and the true status of affairs made known. That same scrutiny which has excluded questionable cases from my paper has been exercised in regard to the acceptance of historical writings not duly authenticated, or, in other words, mythical. I do not desire to even disturb the reputation so well deserved by my friend, Dr. Mackenzie, for a knowledge of the antique in laryngology; but I can not adopt as facts the prehistoric and fabulous romances of ancient Indian writers, so vaguely hinted at by Dr. Mackenzie. They have intentionally suffered the fate of exclusion from my literary researches, which cover the period from 400 B. C. to January, 1886, A. D. In the preparation of this paper I have first had regard and respect for the practical in medicine, and subsequently have given what might be considered a fairly exhaustive historical and literary finish. The work has been laborious beyond expectation, and it could never have assumed such proportions but for the unrivaled facilities offered to me by the library of the Surgeon-General's Office. Again, I wish to pay tribute to this library, and to its obliging and accomplished officers.